

	Hits	Search Text
1	5018	(ferro\$4 or ferroelectric) with oxygen
2	27	((ferro\$4 or ferroelectric) with oxygen) and "operation temperature"
3	1218	ferroelectric with oxygen
4	56	(ferroelectric with oxygen) and (operat\$4 near3 temperature)
5	258	nonstoichiometr\$4 near6 oxid\$3
6	174	(nonstoichiometr\$4 near6 oxid\$3) and electric\$4
7	16	(nonstoichiometr\$4 near6 oxid\$3) and (electric\$4 near3 circuit)
8	2	("4,684,207").PN.
9	2	(non-stoichiometric near3 oxide\$2) with gradient\$2
10	106	oxide\$2 with (composition\$3 near2 gradient\$2)
11	11	( oxide\$2 with (composition\$3 near2 gradient\$2)) and (sensor\$2 or detector\$3)
12	10	(( oxide\$2 with (composition\$3 near2 gradient\$2)) and (sensor\$2 or detector\$3)) and oxygen
13	2	"9819152"
14	2	("6312816").PN.
15	3	"03108759"

	Hits	Search Text
16	1	"07082097"
17	2	("5518603").PN.
18	480	zirconia near3 oxygen near3 sensor\$2
19	146	(zirconia near3 oxygen near3 sensor\$2) and ((low or room or ambient) near2 temperature\$2)
20	16	((zirconia near3 oxygen near3 sensor\$2) and ((low or room or ambient) near2 temperature\$2)) and YSZ
21	445	PZT with oxygen
22	9	(PZT with oxygen) and (oxygen near4 sensor\$2)
23	3997	((73/23.31,23.32) or (422/88,90,94,98) or (436/127,136,137,138,151)).CCLS.
24	777	((((73/23.31,23.32) or (422/88,90,94,98) or (436/127,136,137,138,151)).CCLS.) and (oxygen near3 sensor\$2)
25	7	(((((73/23.31,23.32) or (422/88,90,94,98) or (436/127,136,137,138,151)).CCLS.) and (oxygen near3 sensor\$2)) and (ferroelectric\$2 or PZT or YSZ)

09744793

FILE 'CAPLUS' ENTERED AT 15:31:42 ON 07 JAN 2004

L1 53152 FERROELECTRIC

L2 411 FERROELECTRIC? (S) SENSOR?

L3 22 L2 AND OXYGEN

L4 1267 FERROELECTRIC? (S) ("PB" (2A) "ZR" (2A)

L5 1070 L4 AND OXID?

L6 0 L5 AND (OXYGEN (5A) (SENSOR? OR DETECTOR?))

L7 25 L5 AND (SENSOR? OR DETECTOR?)

L8 3 "PZT" (S) (OXYGEN (3A) (SENSOR? OR DETECTOR?))

L9 632 (FERROELECTRIC (S) (SENSOR? OR DETECTOR?))

L10 115 L9 AND ELECTROD?

L11 9 L10 AND OXYGEN

L3 ANSWER 1 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:569032 CAPLUS

DOCUMENT NUMBER: 139:109970

TITLE: Optical-control of dielectric permittivity, optically capacitance-variable capacitors, and UV and magnetometric sensors

INVENTOR(S): Takesada, Masaki; Koshihara, Shinya; Ishikawa, Tadahiko; Yagi, Toshiro; Ito, Mitsuru; Kurita, Masaaki; Shimoda, Hiroaki

PATENT ASSIGNEE(S): Kanagawa Academy of Science and Technology, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 2003209266 A2 20030725 JP 2002-247809 20020827

PRIORITY APPLN. INFO.: JP 2001-263893 A 20010831

AB Photoexcitation of dielec. permittivity of quantum dielec. or ferroelec. crystal held at its near phase-transition temperature is induced by synergetics in impression of elec. field, magnetic field, and light irradiation at its energy equivalent to the band gap energy of the crystal. Therefore, the dielec. permittivity is control to a desired level by light intensity, elec. field, and magnetic field. The process makes possible manufacture of optically capacitance-variable capacitors, UV sensors, and magnetometric sensors.

L3 ANSWER 4 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:32977 CAPLUS

DOCUMENT NUMBER: 136:317658

TITLE: "Characteristics of Pd/BST/Pt for hydrogen detection at different atmospheres"

AUTHOR(S): Deng, J.; Zhu, W.; Tan, O. K.; Chen, X. F.; Yao, X.

CORPORATE SOURCE: Microelectronics Center, School of Electrical & Electronic Engineering, Nanyang Technological University, Singapore, 639798, Singapore

SOURCE: **Ferroelectrics (2001), 263(1-4), 181-186**

CODEN: FEROA8; ISSN: 0015-0193

PUBLISHER: Gordon & Breach Science Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A new application of using barium strontium titanate (BST) thin films to fabricate the metal/ferroelec./metal (MFM) heterostructure for hydrogen gas detection has been investigated. In this paper, the  $(\text{Ba}_{0.67}\text{Sr}_{0.33})\text{TiO}_3$  thin films are prepared using the sol-gel technol. The steady-state hydrogen sensitivity and transient response with different hydrogen concns. diluted in air and in nitrogen are carefully studied. Exptl. results show that the sensitivity is larger, response time is faster, and recovery time is slower for hydrogen in nitrogen than those in air. This discrepancy is due to chemisorbed oxygen on the Pd surface in air. Our previously proposed interface blocking model as the main mechanism for this new type of hydrogen gas sensor using ferroelec. amorphous thin films is confirmed by the new exptl. results. REFERENCE COUNT: 7

L3 ANSWER 5 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:32971 CAPLUS

DOCUMENT NUMBER: 134:201275

TITLE: "Process and fabrication of a lead zirconate titanate thin film pressure sensor"

AUTHOR(S): Zakar, E.; Dubey, M.; Piekarski, B.; Conrad, J.; Piekarz, R.; Widuta, R.

CORPORATE SOURCE: U.S. Army Research Laboratory, Adelphi, MD, 20783-1197, USA

SOURCE: **Journal of Vacuum Science & Technology, A: Vacuum, Surfaces, and Films (2001), 19(1), 345-348**

CODEN: JVTAD6; ISSN: 0734-2101

PUBLISHER: American Institute of Physics

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Lead zirconate titanate (PZT) ferroelec. material is highly attractive for sensor and actuator device applications. Static pressure sensor structures were fabricated using sol-gel deposited PZT spin coated onto Pt/SiO<sub>2</sub>/Si substrates, with the Pt layer forming the bottom electrode. A subsequent Pt layer deposited onto the PZT formed the device top electrode. The resultant Pt/PZT/Pt/SiO<sub>2</sub>/Si stacks were patterned with photoresist and defined by ion beam milling and reactive ion etching in a HC<sub>2</sub>ClF<sub>4</sub> plasma to form elec. capacitor structures. Capacitance measurements were performed on 200 <SYM109>m + 200 <SYM109>m and 300 <SYM109>m + 300 <SYM109>m dimension structures over the frequency range 0.12-100 kHz. Capacitance remained relatively unchanged over this frequency range, with a magnitude corresponding to its predicted value along with a low dissipation factor (0.02), thus verifying the high quality of the device structures. The device is intended to measure pressure in the range of 10,000-100,000 psi.

REFERENCE COUNT: 4

L3 ANSWER 6 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:822793 CAPLUS

DOCUMENT NUMBER: 133:358240

TITLE: Composite iridium-metal-oxygen barrier structure with refractory metal companion barrier and method for its fabrication for capacitor electrode of ferroelectric capacitors

INVENTOR(S): Zhang, Fengyan; Maa, Jer-Shen; Hsu, Sheng Teng; Zhuang, Wei-Wei

PATENT ASSIGNEE(S): Sharp Kabushiki Kaisha, Japan

SOURCE: Eur. Pat. Appl., 16 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

PATENT NO. KIND DATE APPLICATION NO. DATE

EP 1054441 A2 20001122 EP 2000-304334 20000522

EP 1054441 A3 20030102

US 6190963 B1 20010220 US 1999-316661 19990521 JP 2001007298 A2

20010112 JP 2000-149036 20000519 TW 460930 B 20011021 TW 2000-89109874

20000520 US 6288420 B1 20010911 US 2000-703192 20001031

PRIORITY APPLN. INFO.: US 1999-316661 A 19990521

AB An Ir-M-O composite film was provided that is useful in forming an electrode of a ferroelec. capacitor, where M includes a variety of refractory metals. The Ir combination film is resistant to high temperature annealing in O environments. When used with an underlying barrier layer made from the same variety of M transition metals, the resulting conductive barrier also suppresses to diffusion of Ir into any underlying Si substrates. As a result, Ir silicide products are not formed, which degrade the electrode interface characteristics. That is, the Ir combination film remains conductive, not peeling or forming hillocks, during high temperature annealing processes, even in O. The Ir-M-O conductive electrode/barrier structures are useful in nonvolatile FeRAM devices, DRAMs, capacitors, pyroelec. IR sensors, optical displays, optical switches, piezoelec. transducers, and surface acoustic wave devices. A method for forming an Ir-M-O composite film barrier layer and an Ir-M-O composite film ferroelec. electrode are also provided.

L3 ANSWER 7 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:606474 CAPLUS

DOCUMENT NUMBER: 133:316907

TITLE: "Microstructure, dielectric properties and hydrogen gas sensitivity of sputtered amorphous Ba<sub>0.67</sub>Sr<sub>0.33</sub>TiO<sub>3</sub> thin films"

AUTHOR(S): Chen, X. F.; Zhu, W. G.; Tan, O. K.

CORPORATE SOURCE: School of Electrical and Electronic Engineering, Micro-electronics Centre, Nanyang Technological University, Singapore, 639798, Singapore

SOURCE: **Materials Science & Engineering, B: Solid-State Materials for Advanced Technology (2000), B77(2), 177-184**

CODEN: MSBTEK; ISSN: 0921-5107

PUBLISHER: Elsevier Science S.A.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A novel metal-ferroelec. hydrogen gas sensing device was fabricated on platinum-coated silicon wafer with an amorphous ferroelec.  $\text{Ba}_{0.67}\text{Sr}_{0.33}\text{TiO}_3$  layer using the RF magnetron co-sputtering process and was characterized by x-ray diffraction, TEM, dielec. characterization and gas sensing measurement. Exptl. results show that the micro-structure and the dielec. properties are closely correlated with the deposition parameters. The studies on the dielec. properties indicate that the nonstoichiometric defects in the amorphous films are largely reduced by depositing in 50% oxygen content just below the crystallization temperature of the films. J-E performances exhibit the typical Schottky behavior, both in air and in hydrogen gas and a voltage shift 0.6 V was observed in 1042 ppm hydrogen diluted in air. Compared to the sol-gel case, it is believed that the electronic defects, both in bulk and at interface, cause the degradation of the hydrogen gas sensitivity and weaken the induced  $\text{H}_2$  potential built-up across the space charge layer at the interface. The gas sensing mechanism based on the proton induced Pd/BST interfacial polarization potential is also discussed. Related to the MIS hydrogen sensor device, it is believed that the high permittivity of the amorphous ferroelec. thin films enhances the proton polarization at the Pd/BST interface and, in turn, greatly improves the built-up interfacial potential induced by the hydrogen. REFERENCE COUNT: 24

L3 ANSWER 8 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:483105 CAPLUS

DOCUMENT NUMBER: 133:216313

TITLE: "Effects of  $\text{BCl}_3$  addition on  $\text{Ar}/\text{Cl}_2$  gas in inductively coupled plasmas for lead zirconate titanate etching"

AUTHOR(S): *An, Tae-Hyun; Park, Joon-Yong; Yeom, Geun-Young; Chang, Eui-Goo; Kim, Chang-Il*

CORPORATE SOURCE: Huksuk-Dong, 221, Department of Electrical Engineering, Chungang University, Seoul, 156-756, S. Korea

SOURCE: **Journal of Vacuum Science & Technology, A: Vacuum, Surfaces, and Films (2000), 18(4, Pt. 1), 1373-1376**

CODEN: JVTAD6; ISSN: 0734-2101

PUBLISHER: American Institute of Physics

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Lead zirconate titanate ( $\text{PbZr}_x\text{Ti}_{1-x}\text{O}_3$ :PZT) ferroelec. thin films have received great attention for application in nonvolatile memory, IR sensors, electrooptical devices, microelectromech. system devices, etc. In order to accomplish the integration of these devices, the etching process for both PZT films and electrode material must be developed. In this study, PZT etching was performed using planar inductively coupled  $\text{Ar}(20)/\text{Cl}_2/\text{BCl}_3$  plasmas. The etch rate of PZT film was 2450 Å/min at  $\text{Ar}(20)/\text{BCl}_3(80)$  gas mixing ratio and substrate temperature of 80°. XPS anal. for film composition was utilized. The chemical bond of  $\text{PbO}$  is broken by ion bombardment, and the peak of metallic Pb in a Pb 4f peak begins to appear upon etching, decreasing the Pb content faster than Zr and Ti. Also, the relative content of oxygen decreases rapidly. Thus, abundant B and  $\text{BCl}$  radicals probably made a volatile oxycompound such as  $\text{BxOy}$  and/or  $\text{BCl-O}$  bond. To understand the etching mechanism, Langmuir probe and optical emission spectroscopy anal. were utilized for plasma diagnosis. REFERENCE COUNT: 6

L3 ANSWER 9 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:98898 CAPLUS

DOCUMENT NUMBER: 132:126910

TITLE: *Low temperature oxygen gas sensor*

INVENTOR(S): *Mansour, Said; Brazier, Mark; McElfresh, Michael*

PATENT ASSIGNEE(S): *Purdue Research Foundation, USA*

SOURCE: *PCT Int. Appl., 44 pp.*

CODEN: PIXXD2

DOCUMENT TYPE: *Patent*

LANGUAGE: *English*

PATENT NO. KIND DATE APPLICATION NO. DATE

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WO 2000007001 A1 20000210 WO 1999-US17422 19990730

AU 9952495 A1 20000221 AU 1999-52495 19990730

PRIORITY APPLN. INFO.: US 1998-94721P P 19980730

US 1999-123819P P 19990311

WO 1999-US17422 W 19990730

AB *A highly sensitive oxygen gas sensor, which operates at ambient and sub-ambient temps. was developed using nonstoichiometric metal oxides such as ferroelec. PZT materials or yttria stabilized zirconia. The sensor is constructed of a solid state electrolyte thin film of the nonstoichiometric metal oxide material sandwiched between two metal electrodes. An offset d.c. voltage, which is manifested as a translation of the ferroelec. hysteresis loop, develops between the two electrodes when an elec. field is applied. The magnitude and direction of the offset voltage depends on variations in oxygen concentration or partial pressure at one of the device electrodes.*

REFERENCE COUNT: 21

L3 ANSWER 10 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:687628 CAPLUS

DOCUMENT NUMBER: 132:29491

TITLE: *"Novel compositionally graded ferroelectrics for use in oxygen sensing"*

AUTHOR(S): *Mansour, Said A.; Brazier, Mark; McElfresh, Mike*

CORPORATE SOURCE: *School of Materials Engineering, Purdue University, West Lafayette, IN, 47907, USA*

SOURCE: **Proceedings - Electrochemical Society (1999), 99-13(Solid-State Ionic Devices), 354-359**

CODEN: PESODO; ISSN: 0161-6374

PUBLISHER: *Electrochemical Society*

DOCUMENT TYPE: *Journal*

LANGUAGE: *English*

AB *A new class of engineered materials exhibits novel properties which may be useful for oxygen sensing at ambient temps. Compositionally graded lead zirconate titanate (PZT) thin films exhibited a dc-voltage upon applying ac-field across the film using Sawyer-Tower circuit. The voltage across the film increased as oxygen partial pressure at the film was increased. A scenario based on oxygen exchange between the film and*

the surrounding atmospheric under the influence of a strong applied ac-field is suggested. It is believed that oxygen vacancy redistribution and a subsequent change in electrochem. potential across the film causes the dc voltage to develop. REFERENCE COUNT: 14

L3 ANSWER 13 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:293687 CAPLUS

DOCUMENT NUMBER: 129:29991

TITLE: "Capacitive lambda sensor for internal combustion engine"

INVENTOR(S): Bantle, Uwe

PATENT ASSIGNEE(S): Heraeus Sensor-Nite N.V., Belg.; Bantle, Uwe

SOURCE: PCT Int. Appl., 15 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

PATENT NO. KIND DATE APPLICATION NO. DATE

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WO 9819152 A1 19980507 WO 1997-EP5729 19971017

DE 19644569 A1 19980507 DE 1996-19644569 19961027

DE 19644569 C2 19981029

EP 910793 A1 19990428 EP 1997-913152 19971017

R: DE, FR, IT

JP 2001516445 T2 20010925 JP 1998-519987 19971017

PRIORITY APPLN. INFO.: DE 1996-19644569 A 19961027

WO 1997-EP5729 W 19971017

AB The invention concerns a lambda sensor for determining the oxygen partial pressure in exhaust gases, preferably from the internal combustion engine of a motor vehicle. The lambda sensor has at least two electrodes and a sensor-active substance which is disposed between these electrodes and responds to the oxygen partial pressure and whose dielec. values vary as a function of the oxygen partial pressure. The lambda sensor is characterized in that the sensor-active substance takes the form of a substance which alters its relative dielec. constant (<SYM101>R) during the transition from <SYM108> < 1 to <SYM108> > 1 by at least four powers of ten. REFERENCE COUNT: 3

L3 ANSWER 15 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:203165 CAPLUS

DOCUMENT NUMBER: 124:293014

TITLE: Ferroelectric materials for applications in sensor protection

AUTHOR(S): Bhalia, A. S.; Cross, L. E.

CORPORATE SOURCE: Materials Res. Lab., Pennsylvania State Univ., University Park, PA, USA

SOURCE: Report (1995), NV-95-C02; Order No. AD-A298484, 104 pp. Avail.: NTIS From: Gov. Rep. Announce. Index (U. S.) 1996, 96(5), Abstr. No. 05-01,613

DOCUMENT TYPE: Report

LANGUAGE: English

AB The focus of this program has been upon producing and characterizing new functional materials whose properties can be fine tuned to provide eye sensor protection

against laser threats and to suit a range of optoelectronic device applications. Material systems that maximize orientational anisotropy (for use in scattering mode systems) and systems that minimize orientational anisotropy (for use in high field modulators and field induced photo-refractive applications) were both approached. Relaxor ferroelec. tungsten bronze single crystals (Sr,Ba)Nb<sub>2</sub>O<sub>6</sub> and (Pb,Ba)Nb<sub>2</sub>O<sub>6</sub> solid solution families and relaxor ferroelec. perovskite (1-x)Pb(Mg<sup>1/3</sup>Nb<sup>2/3</sup>)O<sub>3</sub>-xPbTiO<sub>3</sub> (PMN-PI) families, were studied extensively. The unique capabilities of a laser heated pedestal growth (LHPG) system were utilized for growth of new materials in single crystal fiber form that produces crystals of long interaction length for optical wave in the crystal and high crystal perfection with maximized properties along chosen directions.

(Mg<sub>0.33</sub>Nb<sub>0.67</sub>)Pb<sub>2</sub>TiO<sub>6</sub>. Hc uniaxial pressing hot forging, or appropriate solid state reaction processing methods were used to produce transparent polycryst. ceramics to provide low scattering high anisotropy ceramics or high scattering high anisotropy ceramics. This final report summarizes significant results produced from this program through combination of exptl. and crystal chemical approaches in this field, delineates conclusions drawn from the research, and provides recommendations for future research.

L3 ANSWER 16 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:58354 CAPLUS

DOCUMENT NUMBER: 124:104057

TITLE: Metalorganic chemical vapor deposition of layered structure oxides

INVENTOR(S): Desu, Seshu B.; Tao, W.

PATENT ASSIGNEE(S): Ceram Inc., USA; Sharp Kabushiki; Virginia Polytechnic Institute and State University

SOURCE: U.S., 11 pp.

CODEN: USXXAM

PATENT NO. KIND DATE APPLICATION NO. DATE

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US 5478610 A 19951226 US 1994-300339 19940902 US 5873977 A  
19990223 US 1995-393233 19950222 JP 08181128 A2 19960712 JP 1995-190899  
19950726 JP 3114916 B2 20001204 JP 08073222 A2 19960319 JP 1995-210774  
19950818 JP 3436617 B2 20030811

PRIORITY APPLN. INFO.: US 1994-300176 B2 19940902 US 1994-300177 B2  
19940902 US 1994-300339 A2 19940902 US 1995-393233 A 19950222  
US 1995-454029 A 19950530

AB A method of fabricating high quality layered structure oxide ferroelec. thin films is claimed. The ferroelec. layered structure oxide is at least one of the compds.: AnBi<sub>3</sub>Tin+1RO<sub>3n+9</sub>, ABi<sub>2</sub>R<sub>2</sub>O<sub>9</sub>, Bi<sub>2n+2</sub>Ti<sub>4-n</sub>O<sub>12-n</sub>, or An+1Bi<sub>4</sub>Tin+4O<sub>15+3n</sub>, where A = Ca, Pb, Sr, or Ba; R = Nb or Ta; and n = 0 or 1. The deposition process is a chemical vapor deposition process involving chemical reaction between volatile metal organic compds. of various elements comprising the layered structure material to be deposited, with other gases in a reactor, to produce a nonvolatile solid that deposits on a suitably placed substrate such as a conducting, semiconducting, insulating, or complex integrated circuit substrate. The source materials for this process may include organometallic compds. such as alkyls, alkoxides, <SYM98>-diketonates or metallocenes of each individual element comprising the layered structure material to be deposited and oxygen.

Preferably, the reactor in which the deposition is done is either a hot wall or a cold wall reactor and the vapors are introduced into this reactor either through a set of bubblers or through a direct liquid injection system. The ferroelec. films can be used for device applications such as in capacitors, dielec. resonators, heat sensors, transducers, actuators, nonvolatile memories, optical waveguides and displays.

L3 ANSWER 18 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1994:515582 CAPLUS

DOCUMENT NUMBER: 121:115582

TITLE: Manufacture and properties of thin barium and strontium titanate films

AUTHOR(S): Gerblinger, J.; Meixner, H.

CORPORATE SOURCE: Siemens AG, Munich, D-81730, Germany

SOURCE: Silicates Industriels (1994), 59(1-2), 31-8

CODEN: SIINAT; ISSN: 0037-5225

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Examination of the stoichiometric composition of sputtered titanate films ( $ABO_3$ ;  $A=Ba, Sr$ ;  $B=Ti$ ) by x-ray diffractometry and RSB showed that the A/B ratio in the films is essentially determined by the pressure of the gas during sputtering. Thin, stoichiometric  $BaTiO_3$  films, post-annealed at  $1300^\circ C$  had sufficiently good ferroelec. properties. The behavior of the elec. conductivity of sputtered  $SrTiO_3$  films at high temps. not only confirms the anal. results but also provides the basis for applying these films to the sector of fast O sensors.

L3 ANSWER 19 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1994:43662 CAPLUS

DOCUMENT NUMBER: 120:43662

TITLE: Multilayer ferroelectric-semiconductor structures for controlled sensors with memory

AUTHOR(S): Afanasjev, V. P.; Kramar, G. P.

CORPORATE SOURCE: Saint Petersburg State Electrotech. Univ., St. Petersburg, 197376, Russia

SOURCE: Ferroelectrics (1993), 143(1-4), 299-304

CODEN: FEROA8; ISSN: 0015-0193

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The results of the expts. on the ferroelec. field effect in thin film semiconductors deposited on different ferroelecs. due to the application of the repolarizing elec. field, light and temperature are described. Elec. field and light controlled resistors and capacitors with memory with satisfactory parameters in a wide temperature range were obtained by the deposition of thin semiconductor films of  $Te$ ,  $PbSe$ ,  $SnO_{2-x}$ ,  $VO_{2-x}$ ,  $CdS$ ,  $a-Si:H$  on ferroelec. single crystals, ceramics and films. The interpretation of the observed effects is based on a model of the existence of nonuniform potential relief at the ferroelec.-semiconductor interface and of potential barriers at the grain boundaries of a semiconductor and their dependence on the value and sign of the ferroelec. polarizing charge. The ferroelec.-semiconductor structure can be used as the basis for creation of

controlled resistors and photoresistors, capacitors and photocapacitors with memory and storage of information without power source, meters of light pulses and also temperature-sensitive resistors with controlled properties.

L3 ANSWER 21 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1984:578407 CAPLUS

DOCUMENT NUMBER: 101:178407

TITLE: Amorphous bismuth-tungsten oxide

PATENT ASSIGNEE(S): Research Development Corp. of Japan, Japan; Masuda, Shuji; Ota, Yukihiro

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 59057916 A2 19840403 JP 1982-167464 19820924

JP 02050057 B4 19901101

PRIORITY APPLN. INFO.: JP 1982-167464 19820924

AB Amorphous  $(\text{Bi}_2\text{O}_3)_{1-x}(\text{WO}_3)_x$ , where  $0.9 < \text{SYM179} > x < \text{SYM179} > 0$ , is described, which is prepared by rapidly quenching a melt of a  $\text{Bi}_2\text{O}_3$  and  $\text{WO}_3$  mixture. Thus, a  $\text{Bi}_2\text{O}_3$  and  $\text{WO}_3$  mixture was heated at  $850^\circ$  for 30 min, placed in an induction-heated Pt tube, and then sprayed over a rotating roll to effect quenching and form a ribbon-shaped amorphous material. The amorphous material may be useful as a catalyst, photoelec. element, O sensor, capacitor, ionic conductor, or ferroelec. material.

L3 ANSWER 22 OF 22 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1976:585426 CAPLUS

DOCUMENT NUMBER: 85:185426

TITLE: Adsorbopolarization and depolarization in the antimony sulfide iodide ferroelectric

AUTHOR(S): Betsa, V. V.; Popik, Yu. V.

CORPORATE SOURCE: Uzhgorod. Gos. Univ., Uzhgorod, USSR

SOURCE: Fizika i Tekhnika Poluprovodnikov (Sankt-Peterburg) (1976), 10(9), 1743-4

CODEN: FTTPA4; ISSN: 0015-3222

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB Elec. current pulses were observed in ferroelec. SbSI single crystals during adsorption and desorption of  $\text{H}_2$  and  $\text{O}_2$  (adsorbopolarization and -depolarization), the magnitudes and time of which depended on the value of and pressure of the adsorbate, its temperature relative to that of the substrate, and the direction of the polarizing field relative to the direction of the natural polarization of the crystal. The pressure dependence of the magnitude of the current pulse at  $<\text{SYM163}>100$  torr could be used to measure gas pressure, and ferroelec. SbSI could be used as a pressure sensor.

L7 ANSWER 1 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:668904 CAPLUS

DOCUMENT NUMBER: 135:245909

TITLE: New piezoceramic PZT-PNN material for medical diagnostics applications

AUTHOR(S): Bove, Torsten; Wolny, Wanda; Ringgaard, Erling; Pedersen, Annette

CORPORATE SOURCE: Ferroperm Piezoceramics A/S, Kvistgaard, DK-3490, Den.

SOURCE: Journal of the European Ceramic Society (2001), 21(10-11), 1469-1472

CODEN: JECSE; ISSN: 0955-2219

PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The development of a new piezoceramic material, Ferroperm Pz21, optimized for use in medical diagnostics applications is described. The requirements to such a material are very high permittivity, sensitivity and coupling factors, and at the same time a relatively high Curie temperature. The structure must furthermore be very dense and fine-grained, since dicing of small sub-elements for medical arrays must be performed without damaging the material. The developed material is a solid solution between a PZT phase and the relaxor phase  $\text{Pb}(\text{Ni}_{1/3}\text{Nb}_{2/3})\text{O}_3$ . A comparison between different production processes is given, and a new solid state route for production of very dense and fine-grained materials is presented. Very pos. characteristics are generally observed, and a stable behavior even at elevated temps. indicate that the material can find applications not only in the medical market, but also as a more general sensor /actuator. REFERENCE COUNT: 7

L7 ANSWER 2 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:213864 CAPLUS

DOCUMENT NUMBER: 135:27368

TITLE: Microfabrication of 32x32 uncooled IR focal plane array

AUTHOR(S): Liu, Weiguo; Sun, Lingling; Zhu, Weiguang; Tan, Ooi Kiang

CORPORATE SOURCE: Microelectronics Center, School of Electrical and Electronic Engineering, Nanyang Technological University, 639798, Singapore

SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (2000), 4230(Micromachining and Microfabrication), 53-57

CODEN: PSISDG; ISSN: 0277-786X

PUBLISHER: SPIE-The International Society for Optical Engineering

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Design and fabrication of a 32 X 32 uncooled IR focal plane array based on Si micromachining technique is presented. Ferroelec. lead zirconate titanate (PZT) thin film was used as the sensing material in the array. The PZT thin film was deposited on the top of Si substrate coated with silicon dioxide, silicon nitride, titanium and platinum. Sol-gel method was used to deposit the PZT film. Size of the sensing element is 60 X 80  $\mu\text{m}^2$  and pixel size is 80 X 100  $\mu\text{m}^2$ , yields a filling factor of 60%. In order to eliminate the thermal loss from the PZT elements to silicon substrate to improve the response of the IR sensor, silicon substrate under the sensing element was etched off using KOH micromachining technique. Membrane composed of silicon dioxide and silicon nitride was formed. Membrane size as large as 3.2 X 3.8  $\text{mm}^2$  is

fabricated. Results proved that micromachining is an effective way in fabricating uncooled IR focal plane array based on ferroelec. thin films. The process is totally compatible with standard IC fabrication techniques. REFERENCE COUNT: 3

L7 ANSWER 3 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:786184 CAPLUS

DOCUMENT NUMBER: 134:60184

TITLE: The effect of non-180° domain on the piezoelectric and dielectric properties of the PSN-PZT ceramics under alternating strong electric field

AUTHOR(S): Yoon, Mansoon; Chae, Hongin

CORPORATE SOURCE: Department of Electronic Materil & Application, Juseong College, Chungbuk, 363-794, S. Korea

SOURCE: Han'guk Seramik Hakhoechi (2000), 37(9), 871-878

CODEN: HSHAF7

PUBLISHER: Korean Ceramic Society

DOCUMENT TYPE: Journal

LANGUAGE: Korean

AB The use of RT66A and a fiber optic technique for the measurement of the piezoelec. and dielec. properties of the 3 mol% Pb(Sb1/2Nb1/2)O3-doped Pb(Zr,Ti)O3 (PSN-PZT) ceramics having morphotropic phase boundary (MPB) was investigated under alternating strong elec. field. To evaluate the contribution of the non-180° domain reorientation in the piezoelec. and dielec. properties of the PSN-PZT ceramics, RT66A and the MTI-2000 Fonic sensor was constructed and the elec. field-induced strain was measured as a function of elec. field and frequency. The elec.-field-induced strain curve showed a large hysteresis under alternating high elec. field and low frequency. The effective piezoelec. constant determined from the elec. field-induced strain increased with decreasing frequency under alternating high elec. field. These behaviors were interpreted as the effect of non-180° domain reorientation.

L7 ANSWER 4 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:642130 CAPLUS

DOCUMENT NUMBER: 133:304261

TITLE: Phase formation studies and structural properties of laser ablated (Pb,La)(Zr,Ti)O3-thin-films on stainless steel

AUTHOR(S): Klarmann, R.; Kuhn, M.; Schey, B.; Lindner, J. K. N.; Biegel, W.; Stritzker, B.

CORPORATE SOURCE: Universitat Augsburg, Institut fur Physik, Augsburg, D-86135, Germany

SOURCE: Materials Research Society Symposium Proceedings (2000), 596 (Ferroelectric Thin Films VIII), 283-288

CODEN: MRSPDH; ISSN: 0272-9172

PUBLISHER: Materials Research Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB High-quality La-doped PZT-films, (Pb,La)(Zr,Ti)O3, can be deposited by pulsed laser deposition (PLD) directly onto stainless steel substrates resulting in a very simple

bicomponental system with high potential for sensor applications. This is an astonishing result, since there is quite a substantial lattice mismatch between the substrate and the PZT-film. Careful studies revealed the existence of a thin oriented nickel oxide layer at the surface of the stainless steel. The formation of this interface layer leads to a reduction of the lattice mismatch thus affecting the subsequent phase formation of the perovskite PZT. The interface was examined by RBS, XRD, TEM / X-TEM studies and SIMS depth profiling. The phase formation and stoichiometry of the PZT films were studied by XRD and EDX and their microstructure and texture by SEM and XRD pole figure measurements. REFERENCE COUNT: 5

L7 ANSWER 5 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:471691 CAPLUS

DOCUMENT NUMBER: 133:244777

TITLE: Preparation and properties of multilayer  $\text{Pb}(\text{Zr},\text{Ti})\text{O}_3/\text{PbTiO}_3$  thin films for pyroelectric application

AUTHOR(S): Liu, W.; Soo Ko, J.; Zhu, W.

CORPORATE SOURCE: School of Electrical and Electronic Engineering, Microelectronics Center, Nanyang Technological University, Singapore, 639798, Singapore

SOURCE: Thin Solid Films (2000), 371(1,2), 254-258

CODEN: THSFAP; ISSN: 0040-6090

PUBLISHER: Elsevier Science S.A.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB To develop a high performance pyroelec. IR detector,  $\text{Pb}_{1.1}(\text{Zr}_{0.3}\text{Ti}_{0.7})\text{O}_3/\text{PbTiO}_3$  (PZT/PT) multilayer thin films were deposited onto the top of a  $\text{Pt}/\text{Ti}/\text{Si}_3\text{N}_4/\text{SiO}_2$  membrane by a modified sol-gel process. For the comparison purpose,  $\text{Pb}_{1.1}(\text{Zr}_{0.3}\text{Ti}_{0.7})\text{O}_3$  (PZT) thin films were also prepared with the identical method under same conditions. X-ray diffraction measurement revealed that the diffraction pattern of the multilayer film was the superimposition of the PZT and PT patterns. At 1 kHz, dielec. constant of 389 and 558, dielec. loss of 1.2 and 1.1% were obtained, resp., for the PZT/PT and PZT thin films. The PZT/PT film showed a lower dielec. constant as expected and a similar dielec. loss compared with those of the PZT film, which is beneficial to use the multilayer thin films as the pyroelec. IR detecting element. Pyroelec. coeffs. for the PZT/PT film and the PZT film were correspondingly 380 and 400  $\text{mV}/\text{m}^2\text{K}$ . Calculated detectivity figures of merit for the PZT/PT and PZT thin films were  $20.3 \pm 10^{-6} \text{ Pa}^{-1/2}$ , and  $18.7 \pm 10^{-6} \text{ Pa}^{-1/2}$ , and values of the voltage response figures of merit were 0.038  $\text{m}^2/\text{C}$  and 0.028  $\text{m}^2/\text{C}$ , resp. At 20 Hz, the dynamic pyroelec. voltage responsivity of 132  $\text{V}/\text{W}$  (in root-mean-square) was obtained for the PZT/PT film and 98  $\text{V}/\text{W}$  (in root-mean-square) for PZT film with the same element size of  $240 \times 360 \text{ m}^2$ . High response of the multilayer thin film was ascribed to its relatively lower dielec. constant when compared to the PZT thin films. Exptl. results showed the PZT/PT multilayer thin film is a good candidate material for developing high performance IR detectors. REFERENCE COUNT: 11

L7 ANSWER 6 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:449152 CAPLUS

DOCUMENT NUMBER: 133:142364

TITLE: (Mn, Sb) doped-Pb(Zr, Ti)O<sub>3</sub> infrared detector arrays

AUTHOR(S): Xu, Y. Q.; Wu, N. J.; Ignatiev, A.

CORPORATE SOURCE: Space Vacuum Epitaxy Center and Texas Center for Superconductivity, University of Houston, Houston, TX, 77204-5507, USA

SOURCE: Journal of Applied Physics (2000), 88(2), 1004-1007

CODEN: JAPIAU; ISSN: 0021-8979

PUBLISHER: American Institute of Physics

DOCUMENT TYPE: Journal

LANGUAGE: English

AB (Mn, Sb) doped Pb(Zr, Ti)O<sub>3</sub> (PMSZT) thin film IR detectors were integrated with Si substrates. The epitaxial PMSZT thin films, deposited on c-axis oriented YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-y</sub> (YBCO) bottom electrodes, show good ferroelec. properties with a remnant polarization Pr of 31 <SYM109>C/cm<sup>2</sup>, a spontaneous polarization Ps of 38 <SYM109>C/cm<sup>2</sup>, and a coercive field Ec of 21 kV/cm under an elec. field of 76 kV/cm. Doping with Mn and Sb into Pb(Zr, Ti)O<sub>3</sub> (PZT) not only decreased the Curie temperature TC from 350° for PZT to 175° for PMSZT, but also enhanced IR responsivity significantly. PMSZT thin films show high figures of merit, F<sub>i</sub> of 15.5 + 10-9 C cm/J, F<sub>v</sub> of 1758 cm<sup>2</sup>/C and F<sub>d</sub> of 5 + 10-5 Pa-1/2 at 25°. IR detector arrays, fabricated with PMSZT films deposited on YBCO microbridges with an air gap between them and the substrate for reduced thermal mass, show a higher IR voltage responsivity compared to those without an air gap. REFERENCE COUNT: 21

L7 ANSWER 7 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:549218 CAPLUS

DOCUMENT NUMBER: 131:178517

TITLE: "A-site and/or B-site modified PbZrTiO<sub>3</sub> films, their preparation, and devices using them"

INVENTOR(S): *Roeder, Jeffrey R.; Chen, Ing-Shin; Bilodeau, Steven; Baum, Thomas H.*

PATENT ASSIGNEE(S): Advanced Technology Materials, Inc., USA

SOURCE: PCT Int. Appl., 63 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

PATENT NO. KIND DATE APPLICATION NO. DATE

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**WO 9942282** A1 19990826 WO 1999-US1025 19990119

US 6312816 B1 20011106 US 1998-26946 19980220

AU 9922340 A1 19990906 AU 1999-22340 19990119

EP 1056594 A1 20001206 EP 1999-902332 19990119

JP 2002503768 T2 20020205 JP 2000-532267 19990119

US 2002117647 A1 20020829 US 2001-939906 20010827

PRIORITY APPLN. INFO.: US 1998-26946 A 19980220

WO 1999-US1025 W 19990119

AB In a modified PbZrTiO<sub>3</sub> perovskite film, the PbZrTiO<sub>3</sub> material is modified by Sr, Ca, Ba, and/or Mg on the A-sites and/or Nb and/or Ta on the B-sites. The perovskite film may be formed by liquid-delivery MOCVD from metalorg. precursors of the metal components to form PZT, (Pb,Sr)(Zr,Ti)O<sub>3</sub>, and other piezoelec. and ferroelec. thin film materials. The films have utility in nonvolatile ferroelec. memory devices (NV-FerAMs) and in microelectromech. systems (MEMS) as sensor and/or actuator elements, e.g., high-speed digital system actuators requiring low input power levels.

REFERENCE COUNT: 3

L7 ANSWER 8 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:427132 CAPLUS

DOCUMENT NUMBER: 131:94660

TITLE: Electron microscope including x-ray filter and microscopic composition determination using the same

INVENTOR(S): Suga, Mitsuo; Kakibayashi, Hiroshi; Torii, Kazunari; Kamita, Kimio

PATENT ASSIGNEE(S): Hitachi, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 11185689 A2 19990709 JP 1997-356764 19971225

PRIORITY APPLN. INFO.: JP 1997-356764 19971225

AB The microscope comprises an electron beam source, a x-ray detector, and a x-ray filter which may show different transmission characteristics to electron beams with different acceleration voltage. The filter locates between the beam source and the x-ray detector. The sample whose composition is determined by electron microscopy using the microscope, may comprise a strong dielec. material or a ferroelec. material consisting of <SYM179>3 elements. Rapid electron microscopy using the microscope is also claimed.

L7 ANSWER 9 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:108649 CAPLUS

DOCUMENT NUMBER: 130:203633

TITLE: "Ferroelectric PZT/Si structure for integrated sensor applications"

AUTHOR(S): *Verardi, P.; Dinescu, M.; Craciun, F.; Carpentieri, M.*

CORPORATE SOURCE: CNR-Istituto di Acustica "O.M. Corbino", Area di Ricerca Tor Vergata, via del Fosso del Cavaliere 100, Rome, 00133, Italy

SOURCE: **Journal de Physique IV: Proceedings (1998), 8(Pr9, 2<sup>nd</sup> European Meeting on Integrated Ferroelectrics, 1997), Pr9/187-Pr9/190**

CODEN: JPICEI; ISSN: 1155-4339

PUBLISHER: EDP Sciences

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Pulsed laser ablation of ferroelec. PZT thin films on silicon cantilever beams to form composite structures for acceleration sensing applications is reported. Optimal thin-

film growing conditions and voltage sensitivity and linear properties of the sensor as well as piezoelec. properties of the PZT films are presented and discussed in this paper. PZT layers have been deposited on the highly stressed part of silicon cantilever beams, by using a Nd-YAG pulsed laser. The depositions were made onto Au electrodes previously patterned on the silicon beam. The active layers were grown to a thickness of approx. 2  $\mu$ m. A substrate temperature of 375° was found to be sufficient to obtain high crystallization and orientation of the films. Moreover, the moderate heating during deposition allowed one to avoid damage to the Au electrode and Si substrate. The obtained films were analyzed by EDS, x-ray diffraction, SIMS, and SEM. After deposition, the upper electrode was patterned and the silicon beam was mounted on a holder. A few different sensor structures have been constructed. An acceleration of the support applied by a standard vibrator device produced a variation of stress in the silicon beam which was sensed by the piezoelec. thin film whose output signal was amplified by a charge amplifier and calibrated with a standard accelerometer. The frequency response and voltage sensitivity have been obtained for each configuration. The piezoelec. coefficient and free dielec. permittivity have been also obtained. These simple cantilever expts. confirmed that a piezoelec. thin-film structure can be used in integrated sensors on silicon substrates. REFERENCE COUNT: 7

L7 ANSWER 10 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:32845 CAPLUS

DOCUMENT NUMBER: 130:161041

TITLE: Phase transformations in smart materials

AUTHOR(S): Newnham, Robert E.

CORPORATE SOURCE: Materials Research Laboratory, The Pennsylvania State University, University Park, PA, 16802, USA

SOURCE: Acta Crystallographica, Section A: Foundations of Crystallography (1998), A54(6, Pt. 1), 729-737

CODEN: ACACEQ; ISSN: 0108-7673

PUBLISHER: Munksgaard International Publishers Ltd.

DOCUMENT TYPE: Journal; General Review

LANGUAGE: English

AB A review, with approx. 14 refs. One of the qualities that distinguishes living systems from inanimate matter is the ability to adapt to changes in the environment. Smart materials have the ability to perform both sensing and actuating functions and are, therefore, capable of imitating this rudimentary aspect of life. Four of the most widely used smart materials are piezoelec.  $\text{Pb}(\text{Zr},\text{Ti})\text{O}_3$ , electrostrictive  $\text{Pb}(\text{Mg},\text{Nb})\text{O}_3$ , magnetorestrictive  $(\text{Tb},\text{Dy})\text{Fe}_2$  and the shape-memory alloy NiTi. All four are ferroic with active domain walls and two phase transformations, which help to tune the properties of these actuator materials.  $\text{Pb}(\text{Zr},\text{Ti})\text{O}_3$  is a ferroelec. ceramic which is cubic at high temperature and becomes ferroelec. on cooling through the Curie temperature. At room temperature, it is poised on a rhombohedral-tetragonal phase boundary which enhances the piezoelec. coeffs. Terfenol,  $(\text{Tb},\text{Dy})\text{Fe}_2$ , is also cubic at high temperature and then becomes magnetic on cooling through its Curie temperature. At room temperature, it too is poised on a rhombohedral-tetragonal transition which enhances its magnetostriction coeffs.  $\text{Pb}(\text{Mg},\text{Nb})\text{O}_3$  and nitinol (NiTi) are also cubic at high temps.

and on annealing transform to a partially ordered state. On further cooling, Pb(Mg Nb)O<sub>3</sub> passes through a diffuse phase transformation at room temperature where it exhibits very large dielec. and electrostrictive coeffs. Just below room temperature, it transforms to a ferroelec. rhombohedral phase. The partially ordered shape-memory alloy NiTi undergoes an austenitic (cubic) to martensitic (monoclinic) phase change just above room temperature. It is easily deformed in the martensitic state but recovers its original shape when reheated to austenite. The structural similarities between these four superb actuator materials are remarkable, and provide a key to the development of future smart materials. REFERENCE COUNT: 14

L7 ANSWER 11 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:106299 CAPLUS

DOCUMENT NUMBER: 128:211894

TITLE: Ferroelectric thin film, its manufacture, and ferroelectric thin film device

INVENTOR(S): Sato, Mihoko; Shirakawa, Yukihiko

PATENT ASSIGNEE(S): TDK Electronics Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 10041186 A2 19980213 JP 1996-210447 19960723

PRIORITY APPLN. INFO.: JP 1996-210447 19960723

AB The film contains 100 parts lead titanium zirconate and 0.1-15 parts Cu. The film is manufactured by using a mixed solution containing a hydrolyzable Pb-, Zr-, Ti-, and Cu-based compound by sol-gel processing. The device containing the compound shows high reliability. The film has a perovskite-type structure. The device may be a memory device, an IR sensor, etc.

L7 ANSWER 12 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:57113 CAPLUS

DOCUMENT NUMBER: 128:173870

TITLE: Integrated ferroelectric ceramic layers for IR detector array: material- and thin layer technology

AUTHOR(S): Bruchhaus, R.; Hofmann, G.; Neumann, N.; Simon, M.

CORPORATE SOURCE: Siemens AG, Munchen, 81730, Germany

SOURCE: Werkstoffe fuer die Informationstechnik, Symposium 1, Werkstoffwoche '96, Stuttgart, 1996 (1997), Meeting Date 1996, 189-196. Editor(s): Thomann, H. DGM Informationsgesellschaft: Oberursel, Germany.

CODEN: 65NSAQ

DOCUMENT TYPE: Conference

LANGUAGE: German

AB Ferroelec. ceramic layers of perovskite  $\text{Pb}(\text{Zr}, \text{Ti})\text{O}_3$  (PZT) and  $\text{PbTiO}_3$  were obtained by multi-target sputtering onto a silicon substrate. Deposition conditions are discussed in detail. The design for an IR pyroelec. detector array is presented.

REFERENCE COUNT: 8

L7 ANSWER 13 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:241093 CAPLUS

DOCUMENT NUMBER: 126:346348

TITLE: Preparation and pyroelectric properties of  $(\text{Pb}, \text{La})(\text{Zr}, \text{Ti})\text{O}_3$  ceramics

AUTHOR(S): Kobune, Masafumi; Mineshige, Atsushi; Fujii, Satoshi; Maeda, Yasumori; Furumoto, Junko

CORPORATE SOURCE: Faculty of Engineering, Himeji Institute of Technology, Himeji, 671-22, Japan

SOURCE: Journal of the Ceramic Society of Japan (1997), 105(April), 312-316

CODEN: JCSJEW

PUBLISHER: Ceramic Society of Japan

DOCUMENT TYPE: Journal

LANGUAGE: Japanese

AB High d. lanthanum-modified lead zirconate titanate (PLZT) ceramics with compns. of  $[(\text{Pb}_{0.925}\text{La}_{0.075})(\text{Zr}_y\text{Ti}_{1-y})_{0.981}\text{O}_3 + 0.5 \text{ mass\% MnO}_2]$ , where  $y = 0-0.10$ , where synthesized by hot isostatic pressing (HIP). All the pressed samples had the high relative d. of 99.9% of theor. d. The pyroelec. properties of the poled PLZT ceramics with  $y = 0-0.10$  were evaluated. The relative dielec. constant  $\epsilon_r$  at room temperature was 290-334 and increased linearly with increasing Zr content, while the Curie temperature  $T_C$  decreased slightly. The rates of linear increase  $m_1$  and decrease  $m_2$  calculated from the slope of the linear plot of  $\epsilon_r$  and  $C$  with  $y$  were approx.  $4.0/\text{mol\% Zr}$  and  $0.6^\circ\text{C}/\text{mol\% Zr}$ , resp. Assuming that the volume sp. heat  $C_v$  of the present samples with  $y = 0-0.10$  are  $3.2 + 106 \text{ J/m}^3\cdot\text{K}$ ,  $y = 0.10$  PLZT sample exhibited the highest figures of merit F.M. for voltage responsivity of around  $0.20 + 10^{-12} \text{ C}\cdot\text{m/J}$  and F.M.D.\* for specific detectivity  $D^*$  of around  $0.57 + 10^{-10} \text{ C}\cdot\text{m/J}$ , among the nine samples studied here. The figure of merit F.M.D.\* of  $y = 0.10$  PLZT sample matched  $\epsilon_r$  of element materials with those of field-effect transistors (FET) used in the sensor circuit was superior to those of PLZT (4/44/56) ceramic and  $\{(1-x)\text{Pb}_{0.9}\text{La}_{0.9}\text{La}_{0.1}\text{Ti}_{0.975}\text{O}_3 + x\text{MgO}\}$  (PLMT) ceramic with  $x = 0.005$  that have been previously reported.

L7 ANSWER 14 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:665864 CAPLUS

DOCUMENT NUMBER: 126:160870

TITLE: Modified PZT system for pyroelectric IR sensor

AUTHOR(S): Hwang, Hak-In; Park, Joon-Shik; Auh, Keun-Ho

CORPORATE SOURCE: Dept. of Ceram. Eng., Hanyang Univ., Seoul, S. Korea

SOURCE: Yoop Hakhoechi (1996), 33(8), 863-870

CODEN: YPHJAP; ISSN: 0372-7807

PUBLISHER: Korean Ceramic Society

DOCUMENT TYPE: Journal

LANGUAGE: Korean

AB Fabricated modified PZT system for pyroelec. IR sensor were analyzed and characterized for dielec., piezoelec. and pyroelec. properties. Particle size and distribution of source powders were controlled by attrition milling process.  $0.05\text{Pb}(\text{Sb}_{0.5}\text{Sn}_{0.5})\text{O}_3$  (PSS) +  $0.11\text{PbTiO}_3$  (PT) +  $0.84\text{PbZrO}_2$  (PZ) + 0.4 wt%MnO<sub>2</sub> system was fabricated and investigated for sintering d., crystal structure and microstructure in relation to sintering conditions, sintering temperature and sintering atmospheric. The poled sintered system of  $y = 0.11$  showed the lowest dielec. constant. Dielec. constant increased with increasing  $y$ -mole ratio. The pyroelec. properties of modified PZT systems which were assembled in a TO-5 package were measured by IR measurement system, average out-voltage of  $0.05\text{PSS} + 0.11\text{PT} + 0.84\text{PZ} + 0.4 \text{ wt\% MnO}_2$  was 3V.

L7 ANSWER 15 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:385813 CAPLUS

DOCUMENT NUMBER: 125:46953

TITLE: Ferroelectric thin film device having space

INVENTOR(S): Takeuchi, Takayuki; Nagao, Nobuaki; Iijima, Kenji

PATENT ASSIGNEE(S): Matsushita Electric Ind Co Ltd, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 08078735 A2 19960322 JP 1994-208475 19940901

PRIORITY APPLN. INFO.: JP 1994-208475 19940901

AB In the device having a ferroelec. thin film between a pair of electrodes on a substrate, the ferroelec. thin film has a space under a part of the substrate. The device is useful for IR sensors and oscillators, etc. The device showed improved sensitivity.

L7 ANSWER 16 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:234937 CAPLUS

DOCUMENT NUMBER: 124:329781

TITLE: Sol-gel derived PZT force sensor for scanning force microscopy

AUTHOR(S): Lee, C.; Itoh, T.; Sasaki, G.; Suga, T.

CORPORATE SOURCE: Nanometer-scale Manufacturing Science Laboratory,  
Research Center for Advanced Science and Technology,  
The University of Tokyo, Komaba 4-6-1, Meguro-Ku,  
Tokyo, 153, Japan

SOURCE: Materials Chemistry and Physics (1996), 44(1), 25-9

CODEN: MCHPDR; ISSN: 0254-0584

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Many sensors and actuators made using  $\text{Pb}(\text{Zr}, \text{Ti})\text{O}_3$  (PZT) thin films have been proposed in microelectromech. systems (MEMS), owing to their eminent piezoelec. and

ferroelec. properties. A PZT force sensor of scanning force microscopy (SFM) is conceptualized by its piezoelectricity. The fabrication procedure and performance are interpreted in this paper. The force sensor is cantilever shape with dimensions of  $200 + 50 + 4.15 \times 10^{-6}$  m. A compact force sensing system of SFM is constructed by using the piezoelec. force sensor. A clear image of  $1.0 \times 10^{-6}$  m pitch grating is derived by a SFM with a PZT force sensor. The sensitivity of the PZT force sensor is  $0.44 \text{ fC nm}^{-1}$ . This value is about 3 times the value of the ZnO force sensor. The sensitivity of the SFM is improved when PZT is used as the piezoelec. material for the force sensor, instead of ZnO. It is believed that this PZT force sensor is capable of being applied easily to use in large scale scanning and severe environments such as low temperature and ultrahigh vacuum.

L7 ANSWER 18 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:584463 CAPLUS

DOCUMENT NUMBER: 123:24214

TITLE: "Ferroelectric thin films having superlattice structures and infrared sensors and pressure sensors using them"

INVENTOR(S): *Tabata, Hitoshi; Murata, Osamu*

PATENT ASSIGNEE(S): Kawasaki Heavy Ind Ltd, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 07082097 A2 19950328 JP 1993-174933 19930622

JP 2651784 B2 19970910

PRIORITY APPLN. INFO.: JP 1993-174933 19930622

AB The films comprise laminates of  $< \text{SYM179} > 2$  different ferroelecs. IR sensors and pressure sensors are also claimed.

Alternate laminates of  $\text{SrTiO}_3$  and  $\text{BaTiO}_3$  layers were formed by excimer laser ablation.

L7 ANSWER 23 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1991:645711 CAPLUS

DOCUMENT NUMBER: 115:245711

TITLE: "Ferroelectric device"

INVENTOR(S): *Adachi, Hideo; Watanabe, Hitoshi; Yoshimori, Hiroyuki; Ota, Yoshinori; Funazaki, Jun; Yusa, Atsushi*

PATENT ASSIGNEE(S): Olympus Optical Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

JP 03108759 A2 19910508 JP 1989-245258 19890922

JP 2948836 B2 19990913

PRIORITY APPLN. INFO.: JP 1989-245258 19890922

AB In a ferroelec. device having a substrate, a lower electrode, a ferroelec. thin film (e.g., PbTiZrO-based material), and an upper electrode, the polarization axis of the ferroelec. thin film is tilted from orthogonal plane to both electrodes. This ferroelec. device can be used as sensors, transducers, actuators, etc.

L7 ANSWER 25 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1988:7948 CAPLUS

DOCUMENT NUMBER: 108:7948

TITLE: Humidity sensors using potassium dihydrogen phosphate (KH<sub>2</sub>PO<sub>4</sub>)-doped porous lead lanthanum zirconate titanate [(Pb, La)(Zr, Ti)O<sub>3</sub>]

AUTHOR(S): Sadaoka, Y.; Matsuguchi, M.; Sakai, Y.; Aono, H.; Nakayama, S.; Kuroshima, H.

CORPORATE SOURCE: Fac. Eng., Ehime Univ., Matsuyama, 790, Japan

SOURCE: Journal of Materials Science (1987), 22(10), 3685-92

CODEN: JMTSAS; ISSN: 0022-2461

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Humidity sensing devices were prepared using fine porous (Pb,La)(Zr,Ti)O<sub>3</sub> (PLZT) particles with ferroelec. instead of insulating metal oxides such as Al<sub>2</sub>O<sub>3</sub> and zircon. The impedance of PLZT with 1 weight% KH<sub>2</sub>PO<sub>4</sub> was 106  $\Omega$ , less than that of zircon with 3.8 weight% KH<sub>2</sub>PO<sub>4</sub> by a factor of 102 in a dry atmospheric. The impedance in a humid atmospheric was controlled by adding KH<sub>2</sub>PO<sub>4</sub> and changed by apprx. 4 orders of magnitude at 0-90% relative humidity and 1 KHz for samples burnt at 700°. The humidity dependence of the impedance is governed mainly by the change of the coverage by adsorbed H<sub>2</sub>O. The hydrophilicity is affected by the burning temperature and La content of PLZT. The resistive component inserted in parallel with the capacitive component decreases steeply with increasing humidity, while the capacitive component has low dependence on the humidity.

L8 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:785167 CAPLUS

DOCUMENT NUMBER: 128:79966

TITLE: Breath detection sensor for oxygen delivery system

AUTHOR(S): Murayama, Yuki; Hashiguchi, Isamu

CORPORATE SOURCE: Japan

SOURCE: Sumitomo Kinzoku Kozan Chuken Shoho (1996), 11(2), 21-26

CODEN: SKKSF5

PUBLISHER: Sumitomo Kinzoku Kozan K.K., Gijutsu Honbu, Chuo kenkyusho

DOCUMENT TYPE: Journal

LANGUAGE: Japanese

**AB** An inspiration and expiration detection sensor has been developed from remodeling of the air pressure sensor. The sensor element is pyroelec. PZT, which detects temperature change and derives the pressure signal. Air of the breath, therefore, must flow through a heater which is set in front of the sensor element. The device shows remarkably high sensitivity and high reliability. It has been applied to the oxygen delivery system for the dyspneal patient.

L11 ANSWER 8 OF 9 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:520013 CAPLUS

DOCUMENT NUMBER: 125:207937

TITLE: Infrared photocurrent study of PZT/YBCO and PMSZT/YBCO heterostructures

AUTHOR(S): Wu, N. J.; Liu, D.; Chen, Y. S.; Lin, H.; Zomorrodian, A. R.; Ignatiev, A.

CORPORATE SOURCE: Space Vacuum Epitaxy Center, University Houston, Houston, TX, 77204-5507, USA

SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (1996), 2746(Infrared Detectors and Focal Plane Arrays IV), 172-177

CODEN: PSISDG; ISSN: 0277-786X

PUBLISHER: SPIE-The International Society for Optical Engineering

DOCUMENT TYPE: Journal

LANGUAGE: English

**AB** Ferroelec.  $\text{Pb}(\text{Zr}_{0.52}\text{Ti}_{0.48})\text{O}_3$  (PZT) (001) and (Mn,Sn) doped-PZT (PMSZT) (001) thin films were integrated to high  $T_c$  superconducting c-oriented  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  (YBCO) films for use as IR detectors. The films were grown on  $\text{LaAlO}_3(100)$  substrates by the pulsed laser deposition technique. The photocurrent responses of the PZT/YBCO and PMSZT/YBCO heterostructures fabricated as IR detector were measured from room temperature up to the ferroelec. phase transition temps. A stable photocurrent increases with increasing temperature throughout the temperature range. The photocurrent of PMSZT/YBCO IR detector was significantly higher than that of the PZT/YBCO IR detectors at 20-170°. The current enhancement with temperature is strongly polarization dependent and is due to the change of the pyroelec. coefficient of the PZT and PMSZT thin films with temperature. The YBCO thin films in the heterostructure were not used for their superconducting properties, but for their IR reflector-conductive electrode properties and as an atomic template for PZT/PMSZT epitaxial growth. With the high dielec. consts. of PZT (600-800) and PMSZT (300-450) measured and the stable photocurrent in the IR region (above 1  $\mu\text{m}$ ), the PZT/YBCO and PMSZT/YBCO heterostructures are believed to be suitable materials for use in IR detectors applicable at temps. higher than room temperature.

L11 ANSWER 9 OF 9 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:750645 CAPLUS

DOCUMENT NUMBER: 123:148247

TITLE: Ferroelectric thin films, pyroelectric materials for infrared sensors containing the films, and manufacture of the films

INVENTOR(S): Tomozawa, Atsushi; Fujii, Satoru; Fujii, Eiji; Takayama, Ryoichi; Kobune, Masafumi; Fujii, Satoshi

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: Eur. Pat. Appl., 33 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

PATENT NO. KIND DATE APPLICATION NO. DATE

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EP 656429 A1 19950607 EP 1994-118853 19941130

EP 656429 B1 19980812

JP 07211135 A2 19950811 JP 1994-283465 19941117

US 5717157 A 19980210 US 1994-351216 19941130 CN 1111388 A

19951108 CN 1994-119379 19941201 CN 1076850 B 20011226 US 5989395 A

19991123 US 1996-730315 19961011

PRIORITY APPLN. INFO.: JP 1993-301411 A 19931201

US 1994-351216 A3 19941130

AB The thin films comprise  $\text{PbTiO}_3$  containing La, and <SYM179>1 elements that form a 6-coordinate bond with O atoms, selected from Mg and Mn. The thin films do not require a polarization process as bulk crystals do. The ferroelec. thin films are manufactured by depositing a MgO single-crystal substrate, provided in advance with a Pt electrode base, by sputtering on the surface of a substrate heater, evacuating the sputtering chamber, heating the substrate with the heater, introducing sputtering gases Ar and O through a nozzle into the chamber, and maintaining a high vacuum. Then, high-frequency elec. power is applied to a target from a high-frequency elec. power source to generate plasma, and a film is formed on the substrate, and provided with a NiCr electrode by d.c. sputtering. The resulting ferroelec. thin films have high c-axis orientation, and formula, e.g.,  $[(1-x)\text{Pb}1-y\text{La}y\text{Ti}1-y/4\text{O}3+x\text{MgO}]$  ( $x = 0.01-0.10$ ;  $y = 0.05-0.25$ ).

3 ANSWER 1 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:161268 CAPLUS

DOCUMENT NUMBER: 140:21781

TITLE: "Diffusion controlled limited current YSZ based oxygen sensor"

AUTHOR(S): Liu, Enhui; Peng, Dan

CORPORATE SOURCE: Department of Applied Chemistry, Xiangtan University,  
Xiangtan, 411105, Peop. Rep. China

SOURCE: Gongneng Cailiao (2002), 33(4), 415-417

CODEN: GOCAEA; ISSN: 1001-9731

PUBLISHER: Gongneng Cailiao Bianjibu

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

AB The structure and the principle of limiting current type oxygen sensor were studied. The oxygen sensor of limiting current type with a porous layer on platinum film electrode to limit the diffusion rate of oxygen was fabricated by using the solid electrolyte of nanocryst. (20-30 nm)  $(\text{ZrO}_2)_{0.9}(\text{Y}_2\text{O}_3)_{0.1}$ . The relation between temperature and oxygen concentration was tested at 600-700° in a mixture of  $\text{N}_2\text{-O}_2$  with the oxygen concentration of 0-37% (mol). The magnitude of limiting current was in a linear relation

with the concentration of oxygen in a gas mixture of O<sub>2</sub>-N<sub>2</sub> at 600-720° and at voltages of 0.3-1.3 V. The temperature dependence of limiting current (IL) was in direct proportion to T<sup>0.6</sup>, which could be explained by taking into account of a mixed diffusion control mechanism of the mol. and Knudsen diffusion.

L3 ANSWER 2 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:245591 CAPLUS

DOCUMENT NUMBER: 136:408078

TITLE: Pt electrode-based sensor prepared by metal organic chemical vapor deposition for oxygen activity measurements in glass melts

AUTHOR(S): Vargas-Garcia, Roberto; Romero-Serrano, Antonio; Angeles-Hernandez, Miguel; Chavez-Alcala, Federico; Gomez-Yanez, Carlos

CORPORATE SOURCE: Metallurgy and Materials Department, IPN-ESIQIE, Mexico D.F., 07300, Mex.

SOURCE: Sensors and Materials (2002), 14(1), 47-56

CODEN: SENMER; ISSN: 0914-4935

PUBLISHER: Scientific Publishing Division of MYU K.K.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A sensor employing yttria-stabilized zirconia (YSZ) was used to determine the oxygen activity of amber glass at laboratory scale at temps. from 1473 K to 1673 K. The YSZ sensors were coated with Pt electrode films deposited by the metal organic chemical vapor deposition (MOCVD) method to increase the conductivity of the measuring devices and to diminish their response time. The oxygen potential of glass was related to the oxidation state of iron through the Nernst equation and the free energy of the equilibrium reaction between FeO and Fe<sub>2</sub>O<sub>3</sub>. The oxidation reduction in the FeO/Fe<sub>2</sub>O<sub>3</sub> equilibrium moved towards the reduced side when the temperature of molten glass was increased. A strong correlation of the activity ratio (a<sub>FeO</sub><sup>1.5</sup>/a<sub>FeO</sub>) to the R<sub>2</sub>O/C parameter (where R = Na and K) was found at all of the test temps.

REFERENCE COUNT: 16

L3 ANSWER 3 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:913680 CAPLUS

DOCUMENT NUMBER: 136:154859

TITLE: Response characteristics of YSZ oxygen sensor with a Ag-YSZ composite thin film electrode

AUTHOR(S): Usami, Toru; Akao, Noboru; Hara, Nobuyoshi; Sugimoto, Katsuhisa

CORPORATE SOURCE: Department of Metallurgy, Graduate School of Engineering, Tohoku University, Sendai, 980-8579, Japan

SOURCE: Nippon Kinzoku Gakkaishi (2001), 65(10), 916-921

CODEN: NIKGAV; ISSN: 0021-4876

PUBLISHER: Nippon Kinzoku Gakkai

DOCUMENT TYPE: Journal

LANGUAGE: Japanese

AB An oxygen sensor With a Ag.cntdot.YSZ (ZrO<sub>2</sub>-8 mol% Y<sub>2</sub>O<sub>3</sub>) composite thin film electrode deposited on a YSZ disk by ion-beam-sputtering (IBS) was developed.

Compos. of the thin films tested were Ag-10 mol% YSZ and Ag-30 mol% YSZ. The performance of the oxygen sensors was examined at temps. between 573 and 673 K. The mechanism of electrode reactions was inferred on the basis of the results obtained by an AC impedance method. The oxygen sensor with the Ag.cntdot.YSZ composite thin film electrodes showed a Nernstian response in 1.0% oxygen at temps. higher than 593 K. The lowest temperature for the Nernstian response was lower by 25 K than that reported for the sensor with a Ag thin film electrode. After a change in oxygen concentration, the response time of the sensor with the Ag-10 mol% YSZ electrode was shorter than that with the Ag-30 mol% YSZ electrode.

L3 ANSWER 4 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:419190 CAPLUS

DOCUMENT NUMBER: 134:375464

TITLE: The influence of CO<sub>2</sub> on CO detection with YSZ oxygen sensor

AUTHOR(S): Kotzeva, V. P.; Kumar, R. V.

CORPORATE SOURCE: Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, UK

SOURCE: Ionics (2001), 7(1 & 2), 85-87

CODEN: IONIFA; ISSN: 0947-7047

PUBLISHER: Institute for Ionics

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The YSZ (yttria-stabilized zirconia) sensor was utilized in the measurement of CO by quantifying the interference of CO on O<sub>2</sub> detection. The response is based on the equilibrium of the combustion reaction of CO on the surface of the electrode. The effect of the presence of CO<sub>2</sub> on the EMF was investigated and theor. models suggested explaining the results. REFERENCE COUNT: 5

L3 ANSWER 5 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:57504 CAPLUS

DOCUMENT NUMBER: 134:109799

TITLE: Postmortem characterization of one yttria stabilized zirconia (YSZ)-based oxygen sensor

AUTHOR(S): Rodrigues, C. M. S.; Labrincha, J. A.; Marques, F. M. B.

CORPORATE SOURCE: ESTG Polytechnic Inst. of Viana do Castelo, Viana do Castelo, 4900, Port.

SOURCE: Solid State Ionics (2000), 136-137, 671-675

CODEN: SSIOD3; ISSN: 0167-2738

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A zirconia-based oxygen sensor was studied after long exposure to the atmospheric of an industrial glass-making furnace. The study included x-ray diffraction, SEM/EDS, and impedance spectroscopy measurements performed on electrode sections of the sensor tube, along the entire sensor length. The final goal was the identification of the causes for sensor failure and possible correlation between the results obtained from different

destructive and nondestructive techniques. Data obtained was used to demonstrate that the sensor degradation could be evaluated from constant frequency measurements. The range of allowed frequencies (temperature dependent) to be used for such characterization is identified. REFERENCE COUNT: 9

L3 ANSWER 6 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:137123 CAPLUS

DOCUMENT NUMBER: 132:175064

TITLE: Thin zirconia film laminates and their manufacture

INVENTOR(S): Ota, Yukihiro; Setoyama, Makoto; Park, Sheng Soo

PATENT ASSIGNEE(S): Sumitomo Electric Industries, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 2000062077 A2 20000229 JP 1998-230852 19980817

PRIORITY APPLN. INFO.: JP 1998-230852 19980817

AB The laminates, useful for gas sensors, have a thin Y<sub>2</sub>O<sub>3</sub> stabilized ZrO<sub>2</sub> film on a sintered Si<sub>3</sub>N<sub>4</sub> substrate, with or without an electron conductive film in between.

Preferably, the substrate has av pore diameter 0.01-50 <SYM109>m and porosity 30-80% and have acicular crystals having aspect ratio 3-30. The laminates are prepared by ion implantation.

L3 ANSWER 8 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:616545 CAPLUS

DOCUMENT NUMBER: 129:324185

TITLE: Use of high-temperature gas-tight electrochemical cells to measure electronic transport and thermodynamics in metal oxides

AUTHOR(S): Park, Jong-Hee; Ma, Beihai; Park, Eun Tae

CORPORATE SOURCE: Energy Technology Division, Argonne National Laboratory, Argonne, IL, 60439, USA

SOURCE: Korean Journal of Ceramics (1998), 4(2), 103-113

CODEN: KJCEFW; ISSN: 1225-9381

PUBLISHER: Korean Ceramic Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB By using a gas-tight electrochem. cell, the authors can perform high-temperature coulometric titration and measure electronic transport properties to determine the electronic defect structure of metal oxides. This technique reduces the time and expense required for conventional thermogravimetric measurements. The components of the gas-tight coulometric titration cell are an oxygen sensor, Pt/yttria stabilized zirconia (YSZ)/Pt, and an encapsulated metal oxide sample. Based on cell design, both transport and thermodyn. measurements can be performed over a wide range of oxygen partial pressures (pO<sub>2</sub> = 10<sup>-35</sup> to 1 atm). This paper describes the high-temperature gas-tight

electrochem. cells used to determine electronic defect structures and transport properties for pure and doped-oxide systems, such as YSZ, doped and pure ceria (Ca-CeO<sub>2</sub> and CeO<sub>2</sub>), copper oxides and copper-oxide-based ceramic superconductors, transition metal oxides, SrFeCo<sub>0.5</sub>O<sub>x</sub>, and BaTiO<sub>3</sub>. REFERENCE COUNT: 31

L3 ANSWER 9 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:174710 CAPLUS

DOCUMENT NUMBER: 128:238574

TITLE: "Performance of YSZ oxygen sensors protected by electrochemical filters"

AUTHOR(S): Costa, A. D. S.; Labrincha, J. A.; Marques, F. M. B.

CORPORATE SOURCE: Ceramics and Glass Engineering Department, University of Aveiro, Aveiro, 3810, Port.

SOURCE: **Ionics (1995), 1(2), 125-130**

CODEN: IONIFA; ISSN: 0947-7047

PUBLISHER: Institute for Ionics

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The performance of Nernstian Yttria Stabilized Zirconia (YSZ) O sensors can be seriously affected when in contact with some aggressive industrial furnace atms. Longer life time can be obtained for sensors protected with electrochem. filters. The most relevant parameters determining the protected sensor performance are the ratio between the sensor and the filter O electrochem. permeabilities, and the volume of the electrode protection chamber. The ratio between materials electrochem. permeabilities det. the sensor O activity applicability domain and the deviation between the effective (steady state) and desirable (theor.) sensor reading. The protected chamber volume will influence the time response behavior. Theor. predictions on sensor performance are compared with exptl. data obtained for protected YSZ sensors conceived for moderately oxidizing atms. (1 Pa < Po<sub>2</sub> < 21 kPa). Two different cases were studied including one single phase and one composite (ionic + electronic conductor) electrochem. filter.

REFERENCE COUNT: 13

L3 ANSWER 10 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1992:185410 CAPLUS

DOCUMENT NUMBER: 116:185410

TITLE: Characterization of sputtered yttria-stabilized zirconia thin film and its application to a metal-insulator-semiconductor structure

AUTHOR(S): Miyahara, Yuji

CORPORATE SOURCE: Cent. Res. Lab., Hitachi Ltd., Kokubunji, 185, Japan

SOURCE: Journal of Applied Physics (1992), 71(5), 2309-14

CODEN: JAPIAU; ISSN: 0021-8979

DOCUMENT TYPE: Journal

LANGUAGE: English

AB An rf-sputtered yttria-stabilized zirconia (YSZ) thin film was characterized as to its structural and elec. properties. Then a metal-insulator-semiconductor (MIS) structure incorporating it as a part of a multi-insulator was investigated particularly for use in a FET-type oxygen sensor. The YSZ film deposited on a Si<sub>3</sub>N<sub>4</sub> film was found to be a

cubic structure based on x-ray diffraction and reflective high-energy electron diffraction analyses. As cracks were formed at 800°C, annealing treatment of the film should be carried out below that temperature. The leakage current of the sputtered YSZ film was smaller than  $2 \times 10^{-7}$  A/cm<sup>2</sup> in the applied voltage range 0-5 V, which was comparable to that of the calcia-stabilized zirconia film used for a potentiometric oxygen sensor. The dielec. constant of the sputtered YSZ film was  $16 \pm 2$  at 105 Hz. The min. loss tangent was 0.01. The frequency dispersion of the dielec. constant and loss tangent were improved by annealing treatment at temps. lower than 400°C. The capacitance-voltage (C-V) characteristics of the MIS structure incorporating the YSZ film showed hysteresis and pos. shifts of the flatband voltages as compared with those of the MIS structure without the YSZ film. The hysteresis was considered to be due to the movement of charged species such as oxygen ions and/or electrons in the YSZ film, which would cause an unstable response of the FET-type oxygen sensor.

L3 ANSWER 11 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1990:603982 CAPLUS

DOCUMENT NUMBER: 113:203982

TITLE: "Impedance and voltage relaxation studies of the oxygen sensor systems platinum/oxygen/yttria-stabilized zirconia, platinum/oxygen/titanium dioxide, and platinum/oxygen/<SYM100>-bismuth sesquioxide"

AUTHOR(S): *Leibold, B.; Nicoloso, N.*

CORPORATE SOURCE: Max-Planck-Inst. Festkoerperforsch., Stuttgart, D-7000/80, Fed. Rep. Ger.

SOURCE: NATO ASI Series, Series C: Mathematical and Physical Sciences (1989), 276(Non-Stoichiom. Compd.: Surf., Grain Boundaries Struct. Defects), 557-79

CODEN: NSCSDW; ISSN: 0258-2023

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The oxygen sensor system Pt/O<sub>2</sub>/YSZ (yttria-stabilized zirconia), Pt/O<sub>2</sub>/TiO<sub>2</sub> and Pt/O<sub>2</sub>/<SYM100>-Bi<sub>2</sub>O<sub>3</sub> were studied by impedance and voltage relaxation measurements. Mainly single-crystal and thin film oxide materials were used. In the case of single-crystal YSZ, the oxygen exchange reaction involves at least two interrelated reaction steps at the Pt or YSZ interface. Tetragonal zirconia polycryst. (TZP) material can be described by a barrier layer model with grain boundary layers «100 Å. Current fractal models are not suited to describe the Pt/O<sub>2</sub>/YSZ system. For single-crystal TiO<sub>2</sub> the surface excess conductivity follows a PO<sub>2</sub><sup>1/2</sup> dependence which indicates adsorption and incorporation of monat. oxygen species like O or O<sup>-</sup>. Thin polycryst. films (300 <SYM163> d <SYM163> 104 Å) show no significant surface contribution. In the case of Pt/O<sub>2</sub>/<SYM100>-Bi<sub>2</sub>O<sub>3</sub>, preliminary voltage relaxation studies indicate that the diffusion coefficient of the minority carriers exceeds the ionic diffusion coefficient by several orders of magnitude. This is the same behavior as seen in the YSZ system.

L3 ANSWER 12 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1990:90523 CAPLUS

DOCUMENT NUMBER: 112:90523

TITLE: "Spectroscopic and electrical studies of yttria-stabilized zirconia for oxygen sensors"

AUTHOR(S): *Schindler, K.; Schmeisser, D.; Vohrer, U.; Wiemhoefer, H. D.; Goepel, W.*

CORPORATE SOURCE: Inst. Phys. Theor. Chem., Univ. Tuebingen, Tuebingen, D-7400, Fed. Rep. Ger.

SOURCE: **Sensors and Actuators (1989), 17(3-4), 555-68**

CODEN: SEACDX; ISSN: 0250-6874

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Surface and interface properties were studied for the system Pt/YSZ (yttria-stabilized zirconia). Interface properties related to the performance of oxygen sensors based on YSZ were discussed. Elemental compns., electronic structures and work functions were studied on pure and platinum-coated surfaces of single-crystal zirconia doped with 10 mol% yttria and of polycryst. sintered material doped with 12 mol% yttria. Spectroscopic methods were x-ray and UV photoemission spectroscopy, ion backscattering spectroscopy, and secondary ion mass spectrometry. Large, reversible changes of surface concns. of yttrium were found between 300 and 1300 K on single-crystal as well as on polycryst YSZ. Evaporated platinum contacts were investigated on YSZ surfaces after heat treatment at different oxygen partial pressures. A layer of adsorbed oxygen on platinum was formed at high oxygen partial pressures. For comparison, current-voltage characteristics were also measured with Pt point-contacts on YSZ single crystals.